Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Previously Presented): A system for superheterodyne detection comprising:

a first conversion unit for performing a first heterodyne operation on an optical input signal to generate an electrical IF signal, the first conversion unit comprising i) a local oscillator for generating a swept local oscillator signal, ii) a coupler for coupling said optical input signal and said swept local oscillator signal, and ii) a photodetector; and

a second conversion unit, electrically coupled to said first conversion unit, comprising i) an electrical local oscillator for generating a fixed electrical local oscillator signal, and ii) a mixer coupled to said electrical local oscillator for performing a second heterodyne operation by mixing said electrical IF signal and said fixed electrical local oscillator signal to generate an electrical output signal suitable for signal processing.

Claim 2 (Canceled)

Claim 3 (Original): The system of claim 1, wherein said first conversion unit comprises:

an IF amplifier; and

an IF filter.

Claim 4 (Canceled)

Claim 5 (Original): The system of claim 1, where said signal processing comprises a reconstruction of an optical spectrum of said optical input signal.

Claim 6 (Original): The system of claim 1, further comprising:

a processor for processing said electrical output signal to measure optical parameters of said optical input signal.

Claim 7 (Original): The system of claim 1, wherein said first conversion unit reduces the effect of intensity noise.

Claim 8 (Original): The system of claim 1, wherein said first conversion unit separates an image in said electrical IF signal to improve amplitude accuracy of said optical input signal.

Claim 9 (Original): The system of claim 1, wherein said first conversion unit produces a non-zero electrical IF signal.

Claim 10 (Original): The system of claim 1, wherein said second conversion unit comprises a microwave image rejection mixer.

Claim 11 (Original): The system of claim 1, wherein said second conversion unit comprises a band pass filter coupled to said first conversion unit, wherein said band pass filter is offset from an electrical local oscillator in said second conversion unit to further reduce an image.

Claim 12 (Original): The system of claim 1, wherein said second conversion unit downconverts said electrical IF signal to said electrical output signal.

Claims 13-21 (Canceled)

Claim 22 (Previously Presented): A method for superheterodyne detection comprising:

performing a first heterodyne operation to combine an optical input signal and an optical swept local oscillator signal to generate an IF signal in an electrical domain, said IF signal implementing a non-zero IF; and

performing a second heterodyne operation to combine said IF signal in said electrical domain and a fixed electrical local oscillator signal to generate an electrical output signal suitable for being processed.

Claim 23 (Original): The method of claim 22, wherein said performing said second heterodyne operation comprises:

downconverting said IF signal in said electrical domain to said electrical output signal.

Claim 24 (Previously Presented): The method of claim 22, further comprising:

filtering said IF signal to reject a first image from a pair of images in said IF signal.

Claim 25 (Previously Presented): The method of claim 22, further comprising:

filtering intensity noise and a first image from a pair of images in said IF signal with an optical filter placed in front of said fist conversion unit that is offset from an optical local oscillator in said first conversion unit.

Claim 26 (Previously Presented): The method of claim 22, further comprising:

processing said output electrical signal to measure an optical field spectrum of said optical input signal.

Claim 27 (Previously Presented): The method of claim 22, further comprising:

processing said electrical output signal to measure parameters of said optical input signal.

Claim 28 (Previously Presented): The method of claim 22, wherein said IF signal comprises a non-zero electrical IF signal.

Claim 29 (Previously Presented): The method of claim 22, further comprising:

performing said second conversion with a microwave image rejection mixer.

Claim 30 (Previously Presented): The method of claim 22, further comprising: filtering said IF signal to reducing an image.

Claim 31 (Previously Presented): A system for superheterodyne detection comprising:

a first conversion unit for performing a first heterodyne operation to combine an optical input signal and a swept optical local oscillator signal, said first conversion unit generating an electrical IF signal;

a second conversion unit electrically coupled to said first conversion unit for performing a second heterodyne operation when combining said electrical IF signal and a fixed electrical local oscillator signal to generate an electrical output signal; and

a balanced detection unit for canceling intensity noise.